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| **Study program:** Doctoral academic studies **-** Chemistry |
| **Course title:** Instrumental Analysis 2 (H331C) |
| **Name of lecturer/lecturers:** Sofija M. Rančić |
| **Type of course:** elective |
| **Number of ECTS allocated:** 10 |
| **Course objectives**Extending theoretical and practical knowledge in the field of microanalysis, automated measurement and application of experimental design, response surface methods and neural network methods for setting up predictive models of experimentally obtained measurement results. |
| **Course outcomes** After successful completing this course, the student will be able to: independently carry out sampling, transfer and storage a small amount/volume of the sample, independently perform analysis of microsamples and compounds in traces after appropriate preparation and preconcentration, successfully use the modern instrumental methods of microanalysis and to set prediction models after analyzing the obtained results measurements. |
| **SYLLABUS***Lectures*Microanalysis and trace analysis - similarities and differences. Collection, transfer and storage of samples. Methods for separation and preconcentration. Solid-phase microextraction: principles and procedures. Elementary microanalysis. Automation and measurement. Principles of automation. Automation of instruments. Instruments used in automated process control. Flow-injection analysis: basic principles, instruments, application for analytical purposes. Optimization of the experimental procedure in analytical chemistry. A one-factor experiment. Experimental design at two and more levels. Response surface method. Central composite design. Box-Bahken design. Artificial neural network. Creating a mathematical model. Model adequacy check. Graphic presentation. |
| **References**1. V. Abramović, Mikroanaliza. Odabrana poglavlja, Drugo dopunjeno i izmenjeno izdanje, Prirodno-matematički fakultet. Novi Sad, 2000. 2. G. D. Chistian, Analytical Chemistry, Wiley International Edition, 6th ed., United States of America, 2003. 3. D. Harvey, Modern Analytical Chemistry, McGraw-Hill International Edition, 2000.4. S. Russell, P. Norvig, Artificial Intelligence - A Modern Approach, Alan Apt, 1995. |
| **Active teaching classes** | **Lectures:** 105 | **Laboratory work:** / |
| **Teaching mode:** lectures, consultations, colloquiums, seminar |
| **ASSESSMENT METHODS AND CRITERIA (Max 100 points)** |
| activity during lectures - 10 points; colloquiums - 30 points; seminar - 15 points; oral exam - 45 points |